

THE CHOICE OF MASTER
CRAFTSMEN



**MASTER
TIG**

SOLUTIONS GUIDE
YOUR GUIDE TO GETTING NEW TIG WELDING BUSINESS

Your Guide to Getting New TIG Welding Business

- *Get new business through products designed for specific industries*
- *Create new sales by upgrading current torch*
- *Create new business through production TIG application products*
- *Generate new sales by focusing on accessories for current torches*

Use this guide by referencing a specific industry and selecting the product for that industry or by referencing a torch model and selecting an upgrade torch.

Selling standard TIG products has become very price competitive and does not offer any real solutions to the end user. With this booklet you will have the ability to provide TIG welding solutions based on actual applications. Learn what to look for on the job site to upgrade your end users to TIG torches and accessories that are made specifically for the job and are unique products in the marketplace. This will focus your sales efforts away from price competitive products to limited distribution premium products that increase your gross profit margin. These items are not available through all welding distributors or through wholesalers. This aids in establishing repeat high profit margin business and getting real solutions to your end users.

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FLEXIBLE PURGE CHAMBER

BENEFITS

- *Less argon required*
- *Collapsible, easily stored*
- *Multiple accessory & glove ports*
- *Less expensive*
- *Less time to fill*
- *Vacuum drawn*
- *Facilitates welding grade atmosphere*
- *30 inch (76.8 cm) diameter*

SPECIFICATIONS

Height:.....20"(51.2cm)
 Width:.....30"(76.8cm)
 Shipping weight:.....47 lbs.(21.3kg)
 Zipper length:60"(153.6cm)
 Standard size:30"(76.8cm) diameter
 24"(61.4cm) base



*Contact CK Worldwide for price and availability on other sizes.

The patented CK Flexible Purge Chamber is used in the Tungsten Inert Gas (TIG) process to provide a completely inert atmosphere for the welding of reactive metals such as titanium, molybdenum, nickel-based and aluminum-based alloys, as well as non-reactive metals like stainless steel. Unique to this design is the ability to draw a vacuum around the product to be welded by collapsing the chamber. The chamber is then filled through a perforated hose that encircles the bottom of the chamber allowing the argon gas to expel all atmospheric gases more effectively through the top valve port. This significantly reduces the time required to reach an inert atmosphere suitable for welding, while using considerably less gas than traditional rigid purge chambers.

INCLUDED PARTS:

- 115V Vacuum pump
- Dual flowmeter/regulator
- 2 Work stations
- 2 Sets of gloves
- 4 Accessory ports
- Heat blanket
- 10' (3m) Argon hose
- 10' (3m) Vacuum hose
- Repair kit
- Instructional DVD
- Storage container

LARGE DIAMETER GAS SAVER™

- Largest diffusion screen available on the market
- 1-1/8 inch I.D. (28.6mm) clear high temperature Pyrex nozzle
- Improves visibility versus standard nozzles
- Weld titanium at low amps without a trailing shield
- Great for tack welding and small crack repair outside of chamber



2 SERIES LARGE DIAMETER KITS: CK EXCLUSIVE

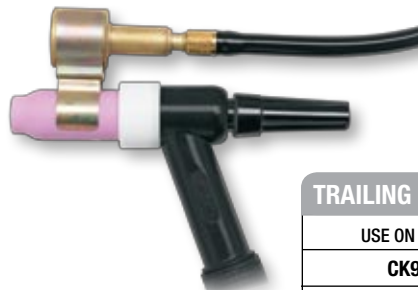
USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER
CK9, CK20	1/16" (1.6mm)	D2GS116LD
	3/32" (2.4mm)	D2GS332LD
	1/8" (3.2mm)	D2GS418LD

4 SERIES LARGE DIAMETER KITS: CK EXCLUSIVE

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER
CK17, CK18, CK26	1/16" (1.6mm)	D4GS116LD
	3/32" (2.4mm)	D4GS332LD
	1/8" (3.2mm)	D4GS418LD

TRAILING SHIELDS

- Clips onto standard or jumbo gas lens cups
- Uses a modified jumbo gas lens as trailing shield
- Can be repositioned for different weld angles
- Includes 25 foot (7.62m) argon hose

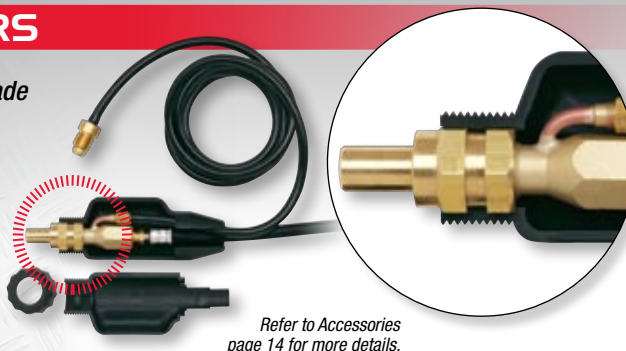


TRAILING SHIELDS:

USE ON TORCHES	CUP SIZE	ORDER NUMBER
CK9, CK20	STANDARD	TS200
	LARGE DIA.	TS300LD
CK17, CK18, CK26	STANDARD	TS300
	LARGE DIA.	TS300LD

SAFE-LOC™ — CABLE EXTENDERS

- Allows quick and easy cable extension “whips” to be made
- All electrical connections are insulated with rugged poly-resin clamshell
- Tweco, Dinse or Camlock style twist fittings available
- Water-cooled or gas-cooled torches are safely and efficiently extended up to 100 feet
- Great for extending “Stinger” electrode holders



Refer to Accessories page 14 for more details.

REMOTE AMPERAGE CONTROL CK EXCLUSIVE

- Replace foot pedal amperage controls with fingertip operated amperage controls
- Velcro strap allows amperage control to quickly mount on any TIG torch or Stick electrode holder
- Amperage controls available as a complete handle assembly
- Rotary or linear potentiometer style available
- Fits most popular TIG machines
- Custom lengths available up to 200 feet



Refer to Accessories page 14 for more details.

STAINLESS STEEL HEAD CK EXCLUSIVE

- 150 amp, 100% duty cycle 17 Series torch designed for harsh welding environments
- Heavy duty stainless steel head eliminates striping or galling of threads
- Thick walled tube in neck resists breaking or bending
- All o-ring constructed valve eliminates worn out or broken ball valves



Refer to page 9 for more details.

FLEX-LOC™ TORCHES — VARIABLE ANGLE TORCH

- 360 degree variable angle torch head
- Locks in any position
- Interchangeable head allows different configurations and head sizes
- Great for “walking the cup” on open root welds for pipe welding
- Access hard to reach welds ergonomically
- Helps prevent carpal tunnel syndrome
- Water or gas cooled



Refer to CK9, CK17, CK20, or CK26 page 8, 9, 10 or 12 for more details.



COLD WIRE FEED

Adding cut length filler rod to the weld puddle in high quality, high production operations is labor intensive, expensive and wasteful. The Cold Wire TIG process is ideally suited for this type of application. The Cold Wire TIG feed system incorporates a wire guide and wire conduit attached to a wire feed machine.

- Increase productivity by up to 30%
- Automates adding of filler metal in TIG welding
- All weld parameters can be duplicated
- Dual Groove Drive Roll system accepts multiple wire sizes
- Uses standard wire spool sizes
- Eliminates TIG rod stub loss
- Cabinet keeps filler wire clean
- Makes fully automatic machine TIG welding possible
- Results in consistent high quality welds



Refer to Production TIG on page 7 for more details.

LARGE DIAMETER GAS SAVER CK EXCLUSIVE

Alloys such as Titanium that require extra shield gas coverage are now being used for aerospace and motorsport components. Standard and large diameter gas lenses are not adequate to insure a larger surface area of shield gas coverage. CK Worldwide's Large Diameter Gas Saver is ideal for titanium tubing. High temperature Pyrex glass gas cups insure full visibility of the weld puddle and directs a uniform gas flow pattern over a very large surface area.

Aerospace and motorsport components present odd angles that need to be welded. Standard tungsten stick-out beyond the gas cup does not allow the torch to be put in the proper position to weld those angles. The Large Diameter Gas Saver allows the tungsten to extend up to 1-1/2 inch beyond the edge of the gas cup giving the welder the ability to access the weld without getting the torch into the angle.

- Largest diffusion screen available on the market
- 1-1/8 inch I.D. (28.6mm) clear high temperature Pyrex nozzle
- Improves visibility versus standard nozzles
- Weld titanium at low amps without a trailing shield
- Great for tack welding and small crack repair outside of chamber



2 SERIES LARGE DIAMETER KITS CK EXCLUSIVE

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER
CK9, CK20	1/16" (1.6mm)	D2GS116LD
	3/32" (2.4mm)	D2GS332LD
	1/8" (3.2mm)	D2GS418LD

4 SERIES LARGE DIAMETER KITS: CK EXCLUSIVE

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER
CK17, CK18, CK26	1/16" (1.6mm)	D4GS116LD
	3/32" (2.4mm)	D4GS332LD
	1/8" (3.2mm)	D4GS418LD

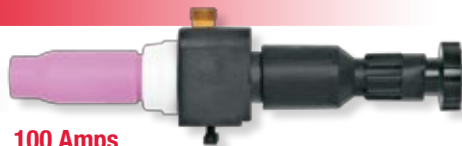
Largest Line of Machine Torches

- All torches are back-loaded, no need to remove cup to make adjustments
- Adjust tungsten up to 1/4 inch (6.4mm) without removing tungsten from torch
- Adjustable backcap allows AVC adjustment while welding
- Uses standard 10N Series cup and collet body, 10N “stubby” collet
- High temperature phenolic resin insulation

GAS-COOLED MACHINE TORCHES

MT100

- Gas-cooled
- 100 amp ACHF or DCSP @ 100%
- 4-1/16 inch (10.3cm) 5-3/4 oz. (163gm)
- 3 Series Head Accessories (4 Series Collet)
- 21HPCA (2310-1879) Power Cable Adapter



100 Amps

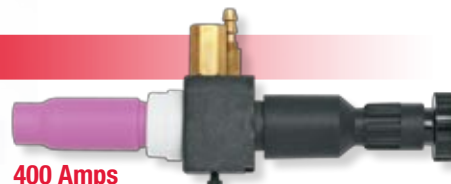
MT100 MACHINE TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD #	SUPERFLEX #
Face Plate Mounted	1 Piece	12½ ft. (3.8m)	MT112	MT112SF
		25 ft. (7.6m)	MT125	MT125SF

WATER-COOLED MACHINE TORCHES

MT400

- Water-cooled
- 400 amp ACHF or DCSP @ 100%
- 4-1/16 inch (10.3cm) 6-1/4 oz. (177gm)
- 3 Series Head Accessories (4 Series Collet)
- M3PCA Power Cable Adapter



400 Amps

MT400 MACHINE TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD #	SUPERFLEX #
Face Plate Mounted	Dual Power Cables	12½ ft. (3.8m)	MT412	MT412SF
		25 ft. (7.6m)	MT425	MT425SF

MT500-7

- Water-cooled
- 500 amp ACHF or DCSP @ 100%
- 7 inch (17.8cm) 12 oz. (340gm)
- 3 Series Head Accessories (4 Series Collet)
- 2PCA Power Cable Adapter



500 Amps

MT500-7 MACHINE TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD #	SUPERFLEX #
Barrel Style	3 Piece	12½ ft. (3.8m)	MT512-7	MT512SF-7
		25 ft. (7.6m)	MT525-7	MT525SF-7

MT500-18

- Water-cooled
- 500 amp ACHF or DCSP @ 100%
- 18 inch (45.7cm) 16 oz. (454gm)
- 3 Series Head Accessories (4 Series Collet)
- 2PCA Power Cable Adapter



500 Amps

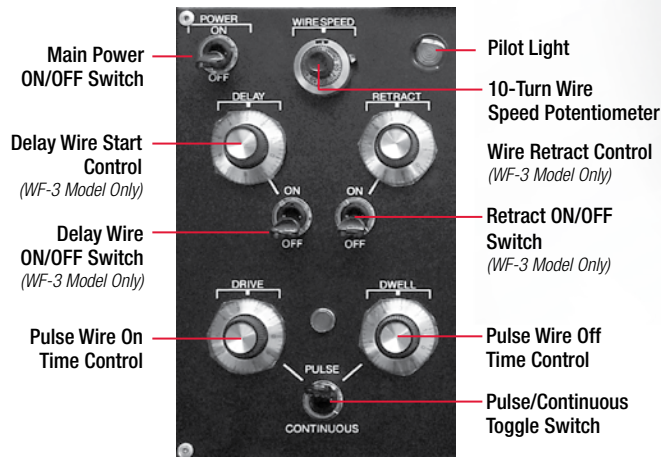
MT500-18 MACHINE TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD #	SUPERFLEX #
Barrel Style	3 Piece	12½ ft. (3.8m)	MT512-18	MT512SF-18
		25 ft. (7.6m)	MT525-18	MT525SF-18



Cold Wire TIG Feeders Maximize Production

- Increase productivity by up to 30%
- Automates adding of filler metal in TIG welding
- All weld parameters can be duplicated
- Dual Groove Drive Roll system accepts multiple wire sizes
- Uses standard wire spool sizes
- Eliminates TIG rod stub loss
- Cabinet keeps filler wire clean
- Makes fully automatic machine TIG welding possible
- Results in consistent high quality welds



FRONT PANEL (WF-3) CONTROL

For complete installation of a Cold Wire TIG System, you need both the Cold Wire Feeder and a TIG torch (hand held or machine mounted) with cold wire TIG capabilities. The Cold Wire TIG System works independent of a standard TIG power supply using normal TIG welding parameters.

CK Worldwide manufactures two models of Cold Wire TIG Feeders. The WF-1 feed unit is designed for use with CK "CWH" series hand torches for semiautomatic welding applications. It has an ON/OFF switch, pilot light, wire feed control, pulse/continuous feed switch, pulse wire on and off timers, and a remote switch receptacle.

The WF-3 feed unit has all the features of the WF-1 feed unit plus controls for automatic operation with CK "CWM" series machine mounted torches. Additional controls include ON/OFF switches and timer controls for delay wire start and wire retract.



HANDHELD

HANDHELD
PENDANT

MACHINE MOUNTED

SPECIFICATIONS

Voltage 115V AC (220V AC 50 Hz. - Special Item)
 Phase Single Phase
 Frequency 50/60 Hz.
 Height 15 in. (38.1cm)
 Width 10 in. (25.4cm)
 Length 21 in. (53.3cm)
 Weight 39 lbs. (17.7kg)
 Motor Type DC permanent magnet
 Motor Rating 1/3 hp at 4000 rpm
 Filler Wire Spool Size 12 in. (30.5cm)
 Filler Wire Sizes023 in. (.5mm), .030 in. (.8mm),
 .035 in. (.9mm), .045 in. (1.1mm), .0625 in. (1.6mm)
 Wire Feed Speed Range 0-500 ipm (0-1250cm)
 Feed Time (pulsed mode) continuously variable
 Dwell Time (pulsed mode) continuously variable
 WF-3 ONLY Delay Start Time continuously variable
 WF-3 ONLY Wire Retract Time continuously variable

WF1 COLD WIRE FEED UNIT CK EXCLUSIVE

APPLICATION	DRIVE ROLL	WIRE SIZE	ORDER NUMBER
Hand Held	20-35DR	.023 in.-.030 in. (.5mm-.8mm)	WF1-030
	30-45DR	.030 in.-.045 in. (.8mm-1.1mm)	WF1-035
	45-564DR	.045 in.-1/16 in. (1.1mm-1.6mm)	WF1-045
	45-564DR	.045 in.-1/16 in. (1.1mm-1.6mm)	WF1-116

WF3 COLD WIRE FEED UNIT CK EXCLUSIVE

APPLICATION	DRIVE ROLL	WIRE SIZE	ORDER NUMBER
Hand Held/ Machine Mounted	20-35DR	.023 in.-.030 in. (.5mm-.8mm)	WF3-030
	30-45DR	.030 in.-.045 in. (.8mm-1.1mm)	WF3-035
	45-564DR	.045 in.-1/16 in. (1.1mm-1.6mm)	WF3-045
	45-564DR	.045 in.-1/16 in. (1.1mm-1.6mm)	WF3-116

CK9

- Light weight, light duty torch
- Constructed with a hardened brass alloy head to reduce thread damage
- Silicon rubber insulation provides best protection against high frequency leakage



TORCH UPGRADES

FLEX-LOC

- 360 degree variable angle torch head
- Locks in any position
- Interchangeable head allows different configurations and head sizes
- Great for "walking the cup" on open root welds for pipe welding
- Access hard to reach welds ergonomically



130 Amps

APPLICATIONS:

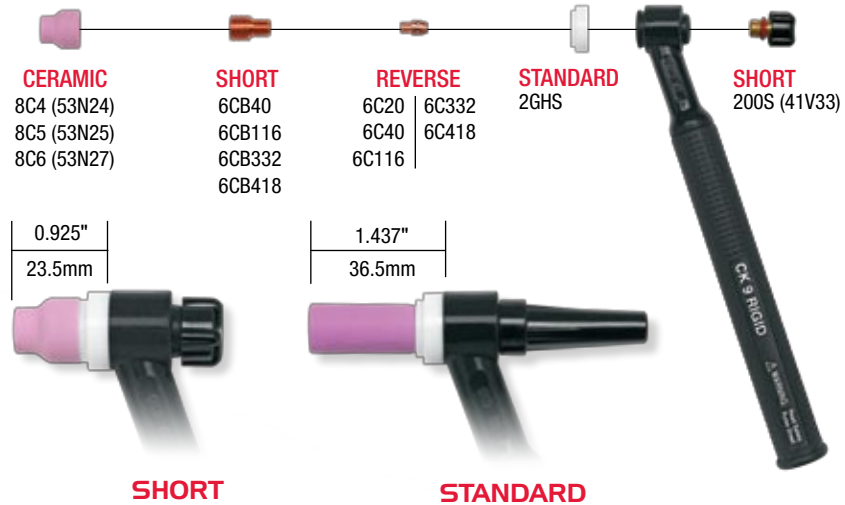
Cup walking on pipe root welds, welds that require a mirror to access weldment.

GAS-COOLED FLEX-LOC TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
FL2L w/o Valve	1 Piece	12-1/2 ft. (3.8m)	FL1312	FL1312SF
		25 ft. (7.6m)	FL1325	FL1325SF
FL2L w/ Valve	1 Piece	12-1/2 ft. (3.8m)	FL1312V	FL1312VSF
		25 ft. (7.6m)	FL1325V	FL1325VSF

STUBBY CONSUMABLES

- Shortens front end of torch to access hard to reach weld joints
- Uses 24 Series nozzles
- Reduces overall length by 1/2 inch (12.8mm)
- Use with short back cap for smallest configuration



SUPER-FLEX™ CABLES

- Lightest most flexible cable assemblies available
- Fits standard gas-cooled or water-cooled torch packages
- Stays flexible even in the coldest environments
- Silicon rubber hose construction with a nylon over-braid to resist abrasion
- Great for intricate, precise welding applications



CK17

- Most popular torch in the world
- More mass in the head of the torch equals more efficient heat dissipation
- Constructed with a hardened brass alloy head to reduce thread damage
- Brass head resists galling and seizing of collet body versus copper head
- Largest metal head insert insures maximum cooling, longer life
- Heavy duty construction allows longer welding time at 150 amps



TORCH UPGRADES

FLEX-LOC

- 360 degree variable angle torch head
- Locks in any position
- Interchangeable head allows different configurations and head sizes
- Great for “walking the cup” on open root welds for pipe welding
- Access hard to reach welds ergonomically
- Helps prevent carpal tunnel syndrome



150 Amps

APPLICATIONS:

Cup walking on pipe root welds, welds that require a mirror to access weldment.

GAS-COOLED FLEX-LOC TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
FL3L w/o Valve	1 Piece	12-1/2 ft. (3.8m)	FL1512	FL1512SF
		25 ft. (7.6m)	FL1525	FL1525SF
FL3L w/ Valve	1 Piece	12-1/2 ft. (3.8m)	FL1512V	FL1512VSF
		25 ft. (7.6m)	FL1525V	FL1525VSF

STAINLESS STEEL HEAD

- 150 amp, 100% duty cycle 17 Series torch designed for harsh welding environments
- Heavy duty stainless steel head eliminates striping or galling of threads
- Thick walled tube in neck resists breaking or bending
- All o-ring constructed valve eliminates worn-out or broken ball valves



150 Amps

APPLICATIONS:

Construction companies, shipyards, vocational schools and any large company that encounters abusive usage of the equipment.

CKC150 & CKC150V RIGID CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	1 Piece	12-1/2 ft. (3.8m)	CKC1512H	CKC1512HSF
		25 ft. (7.6m)	CKC1525H	CKC1525HSF
	2 Piece	12-1/2 ft. (3.8m)	CKC1512N	CKC1512NSF
		25 ft. (7.6m)	CKC1525N	CKC1525NSF
Rigid Head w/ Valve	1 Piece	12-1/2 ft. (3.8m)	CKC1512VH	CKC1512VHSF
		25 ft. (7.6m)	CKC1525VH	CKC1525VHSF
	2 Piece	12-1/2 ft. (3.8m)	CKC1512VN	CKC1512VNSF
		25 ft. (7.6m)	CKC1525VN	CKC1525VNSF

TRIM-LINE™

- Smallest 200 amp torch available in the market
- High amperage torch with physical size of 17 Series
- Larger hardened brass head insert allows 200 amp capacity



200 Amps

APPLICATIONS:

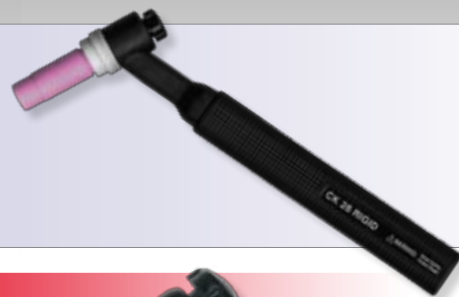
Construction companies, shipyards, job shops, field installers, and any application requiring a high amperage torch when a water cooler is not practical.

TL26 & TL26V RIGID CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	1 Piece	12-1/2 ft. (3.8m)	TL26-12-R RG	TL26-12-RSF RG
		25 ft. (7.6m)	TL26-25-R RG	TL26-25-RSF RG
	2 Piece	12-1/2 ft. (3.8m)	TL26-12-2 RG	TL26-12-2SF RG
		25 ft. (7.6m)	TL26-25-2 RG	TL26-25-2SF RG
Rigid Head w/ Valve	1 Piece	12-1/2 ft. (3.8m)	TL26V-12-R RG	TL26V-12-RSF RG
		25 ft. (7.6m)	TL26V-25-R RG	TL26V-25-RSF RG
	2 Piece	12-1/2 ft. (3.8m)	TL26V-12-2 RG	TL26V-12-2SF RG
		25 ft. (7.6m)	TL26V-25-2 RG	TL26V-25-2SF RG

CK26

- More mass in the head of the torch equals more efficient heat dissipation
- Constructed with a hardened brass alloy head to reduce thread damage
- Brass head resists galling and seizing of collet body versus copper head
- Largest metal head insert insures maximum cooling, longer life
- Heavy duty construction allows longer welding time at 200 amps



TORCH UPGRADES

TRIM-LINE

- Smallest 200 amp torch available in the market
- High amperage torch with physical size of 17 Series
- Larger hardened brass head insert allows 200 amp capacity



200 Amps

APPLICATIONS:

Construction companies, shipyards, job shops, field installers, and any application requiring a high amperage torch when a water cooler is not practical.

TL26 & TL26V RIGID CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	1 Piece	12-1/2 ft. (3.8m)	TL26-12-R	TL26-12-RSF
		25 ft. (7.6m)	TL26-25-R	TL26-25-RSF
	2 Piece	12-1/2 ft. (3.8m)	TL26-12-2	TL26-12-2SF
		25 ft. (7.6m)	TL26-25-2	TL26-25-2SF
Rigid Head w/ Valve	1 Piece	12-1/2 ft. (3.8m)	TL26V-12-R	TL26V-12-RSF
		25 ft. (7.6m)	TL26V-25-R	TL26V-25-RSF
	2 Piece	12-1/2 ft. (3.8m)	TL26V-12-2	TL26V-12-2SF
		25 ft. (7.6m)	TL26V-25-2	TL26V-25-2SF

FLEX-LOC

- 360 degree variable angle torch head
- Locks in any position
- Interchangeable head allows different configurations and head sizes
- Great for "walking the cup" on open root welds for pipe welding
- Access hard to reach welds ergonomically
- Helps prevent carpal tunnel syndrome



150 Amps

APPLICATIONS:

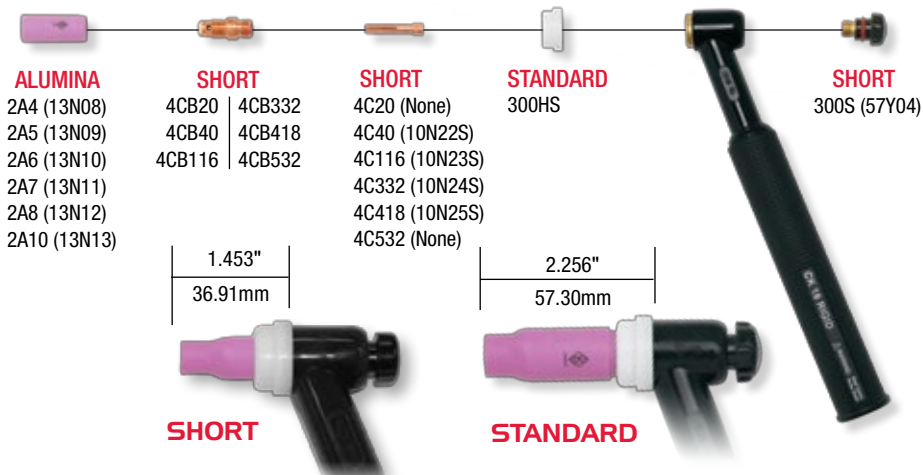
Cup walking on pipe root welds, welds that require a mirror to access weldment.

GAS-COOLED FLEX-LOC TORCH CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
FL3L w/o Valve	1 Piece	12-1/2 ft. (3.8m)	FL1512	FL1512SF
		25 ft. (7.6m)	FL1525	FL1525SF
FL3L w/ Valve	1 Piece	12-1/2 ft. (3.8m)	FL1512V	FL1512VSF
		25 ft. (7.6m)	FL1525V	FL1525VSF

STUBBY SERIES CONSUMABLES

- Shortens front end of torch to access hard to reach weld joints
- Uses 13N Series nozzles
- Reduces overall length by 3/4 inch (19.2mm)
- Use with short back cap for smallest configuration



CK-18

- Largest water jacket available; 300% more cooling
- Largest metal mass insert
- More mass in the head of the torch equals more efficient heat dissipation
- Constructed with a hardened brass alloy head to reduce thread damage
- Brass head resists galling and seizing of collet body versus copper head
- Fail-Safe hose connections eliminates wire ties for positive seal



TORCH UPGRADES

TRIM-LINE

- Smallest 350 amp water-cooled torch at 100% duty cycle
- Large water jacket cools torch more efficiently
- Cooler running torch allows longer life of consumables
- Same physical size as 17 Series
- Lighter weight and size equals greater productivity and less operator fatigue



APPLICATIONS:

High production TIG applications, aluminum boat manufacturers, job shops, any welding application where a standard 18 Series torch is too bulky.

TL18 & TL18V RIGID CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	3 Piece	12-1/2 ft. (3.8m)	TL18-12	TL18-12SF
		25 ft. (7.6m)	TL18-25	TL18-25SF
Rigid Head w/ Valve	3 Piece	12-1/2 ft. (3.8m)	TL18V-12	TL18V-12SF
		25 ft. (7.6m)	TL18V-25	TL18V-25SF

CK510

- Smallest 500 amp water-cooled torch at 100% duty cycle
- Most versatile water-cooled torch available
- Uses .020 inch up to 1/4 inch tungsten electrodes
- Large water jacket cools torch more efficiently
- Cooler running torch allows longer life of consumables



APPLICATIONS:

High amperage welds, heavy aluminum, heavy copper, job shops requiring a versatile torch using .020" to 1/4" tungsten.

CK510 RIGID CK EXCLUSIVE

HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	3 Piece	12-1/2 ft. (3.8m)	CK5112	CK5112SF
		25 ft. (7.6m)	CK5125	CK5125SF

INCREASED COOLING CAPACITY

CK WORLDWIDE



MAX-FLO™

- Up to 4 x the surface area for maximum heat transfer
- Cooler running torch
- Increased amperage capacity
- Longer consumable life
- Less down time
- Will hook up to standard cables and hoses

WELDCRAFT®



CK20

- Most popular water-cooled torch
- Largest water jacket available; 300% more cooling
- Largest metal mass insert
- More mass in the head of the torch equals more efficient heat dissipation
- Constructed with a hardened brass alloy head to reduce thread damage
- Fail-Safe hose connections eliminates wire ties for positive seal



TORCH UPGRADES

FLEX-LOC CK EXCLUSIVE

- 360 degree variable angle torch head
- Locks in any position
- Interchangeable head allows different configurations and head sizes
- Great for "walking the cup" on open root welds for pipe welding
- Access hard to reach welds ergonomically
- Helps prevent carpal tunnel syndrome



APPLICATIONS:

Cup walking on pipe root welds, welds that require a mirror to access weldment, welds requiring different tungsten sizes.

WATER-COOLED FLEX-LOC TORCH CK EXCLUSIVE				
HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
FL2L w/o Valve	3 Piece	12-1/2 ft. (3.8m)	FL2312	FL2312SF
		25 ft. (7.6m)	FL2325	FL2325SF

CK230 CK EXCLUSIVE

- Heavy duty 300 amp 100% duty cycle torch
- Uses 20 series consumables
- Larger water jacket design runs cooler giving longer life to consumables
- Fully achieve 1/8 inch tungsten electrode capability on thick aluminum joints



APPLICATIONS:

Aluminum boat manufacturers, motorcycle manufacturers, bicycle manufacturers, high amperage welding applications with space restrictions.

CK230 & CK230V RIGID CK EXCLUSIVE				
HEAD STYLE	CABLE	LENGTH	STANDARD	SUPERFLEX
Rigid Head w/o Valve	3 Piece	12-1/2 ft. (3.8m)	CK2312	CK2312SF
		25 ft. (7.6m)	CK2325	CK2325SF
Rigid Head w/ Valve	3 Piece	12-1/2 ft. (3.8m)	CK2312V	CK2312VSF
		25 ft. (7.6m)	CK2325V	CK2325VSF

INCREASED COOLING CAPACITY

CK WORLDWIDE



MAX-FLO

- Up to 4 x the surface area for maximum heat transfer
- Cooler running torch
- Increased amperage capacity
- Longer consumable life
- Less down time
- Will hook up to standard cables and hoses

WELDCRAFT®



MICRO-TORCH CK EXCLUSIVE

- 70 or 140 Amps at 100% duty cycle, low profile micro torch
- 45°, 90° and 180° interchangeable heads
- Clear Pyrex nozzle fits on all three heads
- Super-Flex® cable assembly makes it easier to manipulate the torch
- Tungsten gauge and wrench makes installing tungsten easy



Actual size shown

70 amps
Air Cooled
or
140 amps
Water Cooled



MR70 AIR-COOLED MICRO TORCH

HEAD STYLE	CABLE	LENGTH	PART NUMBER
Rigid Head w/o Valve	3 Piece	12-1/2 ft. (3.8m)	MR712SF
		25 ft. (7.6m)	MR725SF

MR140 WATER-COOLED MICRO TORCH

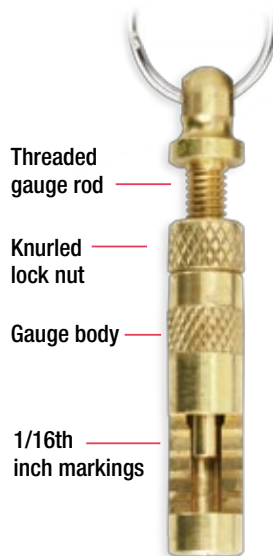
HEAD STYLE	CABLE	LENGTH	PART NUMBER
Rigid Head w/o Valve	3 Piece	12-1/2 ft. (3.8m)	MR1412SF
		25 ft. (7.6m)	MR1425SF

KIT INCLUDES:

- 45°, 90° and 180° interchangeable heads
- .040" (1.0mm), 1/16" (1.6mm) and 3/32" (2.4mm) collets
- 3 Clear Pyrex nozzles
- 3 pieces of Tungsten
- Tungsten Stick-Out Gauge and Wrench

SPECIFICATIONS:

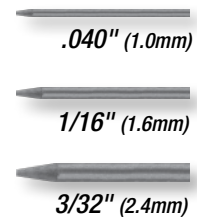
Neck Diameter 0.312" (7.92mm)
 Neck Length 3.100" (78.74mm)
 Cup Diameter 0.360" (9.14mm)
 Cup Length 0.600" (15.24mm)



TUNGSTEN STICK-OUT GAUGE

- Loosen knurled lock nut
- Turn threaded gauge rod to adjust gauge depth (markings are in 1/16th inch increments)
- Lock gauge by turning knurled lock nut firmly against the gauge body

TUNGSTEN SIZES:



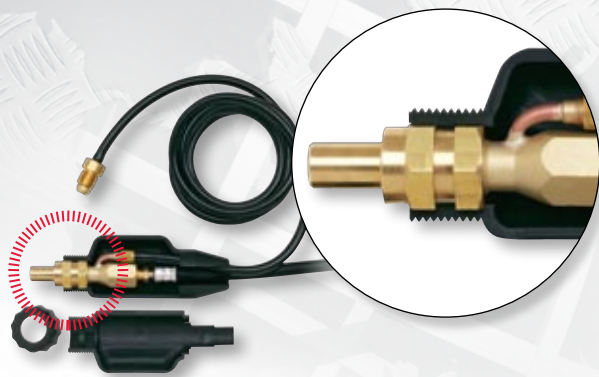
Actual sizes shown

SPECIFICATIONS:

Length 0.9" (22.86mm)
 Grind 20° Grind
 Diameter040" (1.0mm)
 1/16" (1.6mm)
 3/32" (2.4mm)

SAFE-LOC CONNECTORS

- Efficient and safe way to extend power cables
- All electrical connections are insulated with a rugged poly-resin clamshell
- Tweco, Dinse or Cam-Loc twist lock fittings are available
- Available for gas-cooled or water-cooled torches
- Eliminate using a hazardous “stinger” electrode holder to extend cables
- Safely extend cables up to an overall length of 100 feet (30.48m)



CONNECTORS FOR WATER-COOLED TORCHES CK EXCLUSIVE

USED ON TORCHES	DESCRIPTION	PART NUMBER
CK18, CK20	Tweco for water-cooled cables	SLWHAT-T
	Dinse 35 for water-cooled cables	SLWHAT-35

CONNECTORS FOR GAS-COOLED TORCHES CK EXCLUSIVE

USED ON TORCHES	DESCRIPTION	PART NUMBER
CK9, CK17	Tweco for water-cooled cables	SL-2
	Dinse 35 for water-cooled cables	SL2-35
CKC150, TL210	Tweco for water-cooled cables	SL-5
	Dinse 35 for water-cooled cables	SL5-35
CK26, TL26	Tweco for water-cooled cables	SL-8
	Dinse 35 for water-cooled cables	SL8-35

LEATHER VELCRO HOSE COVERS CK EXCLUSIVE

- Abrasion resistant
- Heat resistant
- UV resistant
- Oil resistant
- Flame resistant
- Durable leather protective cover
- Easy opening and closing
- Remains flexible in all climates
- Lightweight, supple
- No more damaged zippers or snaps



LEATHER HOSE COVERS CK EXCLUSIVE

USED ON TORCHES	LENGTH	WIDTH	INSIDE DIAMETER	ORDER NUMBER
CK9, CK20	10 ft. (3.0 m)	3-3/4" (94 mm)	1" (24.5mm)	212HCLV
	22 ft. (7.0 m)	3-3/4" (94 mm)	1" (24.5mm)	225HCLV
CK17, CK18, CK26	10 ft. (3.0 m)	4-1/2" (113 mm)	1-1/4" (30.6mm)	312HCLV
	22 ft. (7.0 m)	4-1/2" (113 mm)	1-1/4" (30.6mm)	325HCLV

REMOTE AMPERAGE CONTROL CK EXCLUSIVE

- Available in either a rotary or linear slide configurations
- Fits most makes and models of TIG power supplies
- Controls contactor on / off, gas solenoids and full range current output
- Available with a Velcro strap or built into the torch handle
- Contact CK for order numbers

ROTARY



Velcro Straps

LINEAR SLIDE



Built-In – Handle
(For CK torches)



FUSE BLOCK

- In-line fuse link protects water-cooled torches and cables
- Less down time repairing burnt up power cables
- Save repair costs by replacing a simple fuse link not an expensive power cable
- With no water circulating, fuse burns up at 12 amps

FUSE BLOCK FOR WATER-COOLED TORCHES

USED ON TORCHES	DESCRIPTION	PART NUMBER
CK20, CK18	550 Amp fuse block & 5 fuses	550FA



SUPER-FLEX CABLES

- Lightweight silicon rubber with nylon overbraid protection
- Available for all gas-cooled or water-cooled torches
- Replaces heavy, stiff cables increasing range of motion
- Stays flexible in harsh weather conditions



WEDGE COLLET CK EXCLUSIVE

- Lasts 10 times longer than standard split collets
- Improves arc starts and arc stability
- Requires less pressure from the backcap improving thread life on torch head
- Tungsten is in direct contact with collet body creating less resistance heating
- Runs cooler minimizing down time replacing collets
- Eliminates twisting and deformation of collet
- Fits any standard collet body or gas lens

FUSE BLOCK FOR WATER-COOLED TORCHES

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER
CK9, CK20	.040" (1.0mm)	2C040GS
	1/16" (1.6mm)	2C116GS
	3/32" (2.4mm)	2C332GS
CK17, CK18, CK26	1/8" (3.2mm)	2C418GS
	.040" (1.0mm)	3C040GS
	1/16" (1.6mm)	3C116GS
	3/32" (2.4mm)	3C332GS
	1/8" (3.2mm)	3C418GS
	5/32" (4.0mm)	3C532GS

precision angled end cut gives "wedge" action for firm hold



slots weaken the collet allowing it to twist, deform or jam

GAS SAVER KITS CK EXCLUSIVE

- Saves up to 40% of shield gas consumption
- Provides better gas coverage versus standard collet bodies
- Allows up to 6 times the diameter of electrode stick-out from gas nozzle
- Clear Pyrex or Alumina push on nozzles available
- Improves visibility
- Less expensive replacement parts than standard gas lenses
- Fits most standard silicon rubber insulated torch bodies

TWO SERIES COMPLETE FRONT END KITS:

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER	
CK9, CK20	1/16" (1.6mm)	D2GS116	ALUMINA
	3/32" (2.4mm)	D2GS332	
	1/8" (3.2mm)	D2GS418	
CK9, CK20	1/16" (1.6mm)	D2GS116-P	PYREX
	3/32" (2.4mm)	D2GS332-P	
	1/8" (3.2mm)	D2GS418-P	

THREE SERIES COMPLETE FRONT END KITS:

USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER	
CK17, CK18, CK26	1/16" (1.6mm)	D3GS116	ALUMINA
	3/32" (2.4mm)	D3GS332	
	1/8" (3.2mm)	D3GS418	
CK17, CK18, CK26	1/16" (1.6mm)	D3GS116-P	PYREX
	3/32" (2.4mm)	D3GS332-P	
	1/8" (3.2mm)	D3GS418-P	



TUNGSTEN ELECTRODES

TUNGSTEN ELECTRODES

ISO 6848 COLOR CHART	TYPE	SIZE	PART NUMBER	
			10 piece	3 piece
Red AWS A5.12 EWTH-2 ISO 6848 WT20	2% Thoriated Tungsten: Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate	1/16 x 7" (1.6mm x 175mm)	T1167GT2	T1167GT2-3
		3/32 x 7" (2.4mm x 175mm)	T3327GT2	T3327GT2-3
		1/8 x 7" (3.2mm x 175mm)	T187GT2	T187GT2-3
White AWS A5.12 NONE ISO 6848 WZ8	.8% Zirconiated Tungsten: Balls well, handles higher current with less spitting, better arc starts and arc stability than pure tungsten	1/16 x 7" (1.6mm x 175mm)	T1167GZ	T1167GZ-3
		3/32 x 7" (2.4mm x 175mm)	T3327GZ	T3327GZ-3
		1/8 x 7" (3.2mm x 175mm)	T187GZ	T187GZ-3
Gold AWS A5.12 EWLA-1.5 ISO 6848 WL15	1.5% Lanthanated Tungsten: Lowest erosion rate, wide current range, no spitting, best DC arc starts and stability	1/16 x 7" (1.6mm x 175mm)	T1167GL	T1167GL-3
		3/32 x 7" (2.4mm x 175mm)	T3327GL	T3327GL-3
		1/8 x 7" (3.2mm x 175mm)	T187GL	T187GL-3
Gray AWS A5.12 EWCE-2 ISO 6848 WC20	2% Ceriated Tungsten: Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability	1/16 x 7" (1.6mm x 175mm)	T1167GC2	T1167GC2-3
		3/32 x 7" (2.4mm x 175mm)	T3327GC2	T3327GC2-3
		1/8 x 7" (3.2mm x 175mm)	T187GC2	T187GC2-3
Green AWS A5.12 EWP ISO 6848 WP	Pure Tungsten: Balls easily, low cost, tends to spit at higher currents, used for non-critical welds only	1/16 x 7" (1.6mm x 175mm)	T1167G	T1167G-3
		3/32 x 7" (2.4mm x 175mm)	T3327G	T3327G-3
		1/8 x 7" (3.2mm x 175mm)	T187G	T187G-3

Other sizes available



GROUND FINISH!

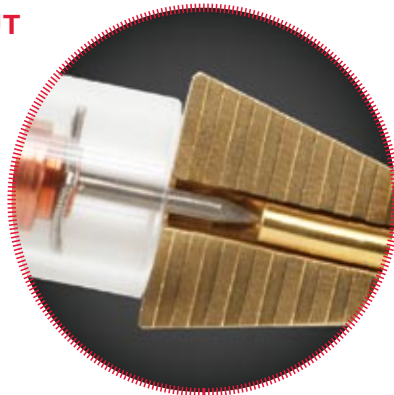


TUNGSTEN STICK-OUT GAUGE

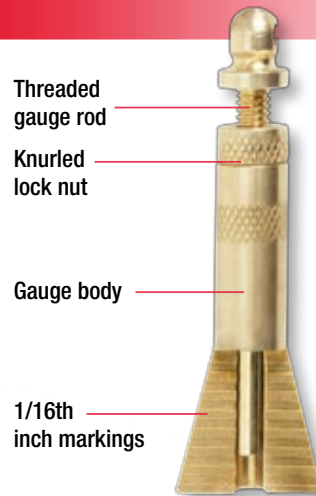


CONSISTENT STICK-OUT ADDS QUALITY TO EVERY WELD

- Consistent stick-out adds quality to every weld
- Great for orbital welders, instructors, weld inspectors
- Insures correct stick-out for gas nozzle being used
- Eliminates tungsten contamination by keeping the tungsten in the gas stream
- Correct stick-out insures undue stress on the ceramic gas nozzle



- Loosen knurled lock nut
- Turn threaded gauge rod to adjust gauge depth. (markings are in 1/16th inch increments)
- Lock gauge by turning knurled lock nut firmly against the gauge body



TUNGSTEN ELECTRODE SELECTOR CHART

BASE METAL TYPE	THICKNESS RANGE	DESIRED RESULTS	WELDING CURRENT	ELECTRODE TYPE	SHIELD GAS	TUNGSTEN PERFORMANCE CHARACTERISTICS
Aluminum Alloys and Magnesium Alloys	ALL	General purpose	ACHF	Pure (EW-P)	Argon	<i>Balls easily, low cost, tends to spit at higher currents, used for non-critical welds only.</i>
				Zirconiated (EW-Zr)	Argon	<i>Balls well, takes higher current, with less spitting and with better arc starts and arc stability than pure tungsten.</i>
				2% Thoriated (EW-Th2)	75 Argon 25 Helium	<i>Higher current range and stability, better arch starts, with lower tendency to spit, medium erosion.</i>
	Only thin sections	Control penetration	DRCP	2% Ceriated (EW-Ce2)	Argon Helium	<i>Lowest erosion rate, widest current rate, AC or DC, no spitting, best arc starts and stability.</i>
	Only thick sections	Increase penetration or travel speed	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	<i>Best stability at medium currents, good arc starts, medium currents, good arc starts, medium tendency to spit, medium erosion rate.</i>
2% Ceriated (EW-Ce2)				Helium	<i>Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.</i>	
Copper Alloys, Cu-Ni Alloys and Nickel Alloys	ALL	General purpose	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	<i>Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate.</i>
				2% Ceriated (EW-Ce2)	75 Argon 25 Helium	<i>Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.</i>
	Only thin sections	Control penetration	ACHF	Zirconiated (EW-Zr)	Argon	<i>Use on lower currents only, spitting on starts, rapid erosion rates at higher currents.</i>
Only thick sections	Increase penetration or travel speed	DCSP	2% Ceriated (EW-Ce2)	Argon Helium	<i>Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.</i>	
Mild Steels, Carbon Steels, Alloys Steels, Stainless Steels and Titanium Alloys	ALL	General purpose	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	<i>Best stability of medium currents, good arc starts, medium tendency to spit, medium erosion rate.</i>
				2% Ceriated (EW-Ce2)	75 Argon 25 Helium	<i>Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.</i>
				2% Lanthanated (EWG-La2)	75 Argon 25 Helium	<i>Lowest erosion rate, widest current range on DC, no spitting, best DC arc starts and stability.</i>
	Only thin sections	Control penetration	ACHF	Zirconiated (EW-Zr)	Argon	<i>Use on lower currents only, spitting on starts, rapid erosion rates at higher currents.</i>
	Only thick sections	Increase penetration or travel speed	DCSP	2% Ceriated (EW-Ce2)	75 Argon 25 Helium	<i>Low erosion rate, wide current range, no spitting consistent arc starts, good stability.</i>
2% Lanthanated (EWG-La2)				Helium	<i>Lowest erosion rate, highest current range, no spitting, best DC arc starts and stability.</i>	

ALUMINIUM (ACHF)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	1/16 (1.6 mm)	4, 5, 6	Argon	15 (7)	20	60 – 80	12 (307.2 mm)
	FILLET							70 – 90	10 (256 mm)
1/8 (3.2 mm)	BUTT	3/32 (2.4 mm)	3/32 – 1/8 (2.4 mm – 3.2 mm)	6, 7	Argon	17 (8)	20	125 – 145	12 (307.2 mm)
	FILLET		3/32 – 1/16 (2.4 mm – 1.6 mm)					140 – 160	10 (256 mm)
3/16 (4.8 mm)	BUTT	1/8 (3.2 mm)	1/8 (3.2 mm)	7, 8	Argon/ Helium	21 (10)	20	190 – 220	11 (258.6 mm)
	FILLET							210 – 240	9 (230.4 mm)
1/4 (6.4 mm)	BUTT	3/16 (4.8 mm)	1/8 (3.2 mm)	8, 10	Argon/ Helium	25 (12)	20	260 – 300	10 (256 mm)
	FILLET							280 – 320	8 (204.8 mm)

WELDING ALUMINUM

The use of TIG welding for aluminum has many advantages for both manual and automatic processes. Filler metal can be either wire or rod and should be compatible with the base alloy. Filler metal must be dry, free of oxides, grease, or other foreign matter. If filler metal becomes damp, heat for 2 hours at 250°F before using. Although ACHF is recommended, DCRP has been successful up to 3/32", DCSP with helium shield gas is successful in mechanized applications.

DEOXIDIZED COPPER (DCSP)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	1/16 (1.6 mm)	4, 5, 6	Argon	18 (9)	15	110 – 140	12 (307.2 mm)
	FILLET							130 – 150	10 (256 mm)
1/8 (3.2 mm)	BUTT	3/32 (2.4 mm)	3/32 (2.4 mm)	4, 5, 6	Argon	18 (9)	15	175 – 225	11 (258.6 mm)
	FILLET							200 – 250	9 (230.4 mm)
3/16 (4.8 mm)	BUTT	1/8 (3.2 mm)	1/8 (3.2 mm)	8, 10	Helium	36 (17.5)	15	190 – 225	10 (256 mm)
	FILLET							205 – 250	8 (204.8 mm)
1/4 (6.4 mm)	BUTT (2)	3/16 (4.8 mm)	1/8 (3.2 mm)	8, 10	Helium	36 (17.5)	15	225 – 260	9 (230.4 mm)
	FILLET							250 – 280	7 (179.2 mm)

WELDING DEOXIDIZED COPPER

Where extensive welding is to be done, the use of deoxidized (oxygen-free) copper is preferable over electrolytic tough pitch copper, although TIG welding has been used occasionally to weld zinc-bearing copper alloys, such as brass and commercial bronzes, it is not recommended because the shielding gas does not suppress the vaporization of zinc. For the same reason zinc-bearing filler rods should not be used. There is some preference of helium for the inert atmosphere in welding thicknesses above 1/8" because of the improved weld metal fluidity. Preheating recommendations should be followed.

MAGNESIUM (ACHF)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	3/32 – 1/8 (2.4 mm – 3.2 mm)	5, 6	Argon	13 (5)	15	60	20 (512 mm)
	FILLET							60	
1/8 (3.2 mm)	BUTT	3/32 (2.4 mm)	1/8 – 5/32 (3.2 mm – 4.0 mm)	7, 8	Argon	19 (9)	15	115	17 (435.2 mm)
	FILLET							115	
1/4 (6.4 mm)	BUTT	3/16 (4.8 mm)	5/32 (4.0 mm)	8	Argon	25 (12)	15	100 – 130	22 (563.2 mm)
	BUTT (2)							110 – 135	20 (512 mm)
1/2 (12.8 mm)	BUTT (2)	1/4 (6.4 mm)	3/16 (4.8 mm)	10	Argon	35 (17)	15	260	10 (256 mm)

WELDING MAGNESIUM

Magnesium alloys are in three groups, they are: (1) aluminum-zinc-magnesium, (2) aluminum-magnesium, and (3) manganese-magnesium. Since magnesium absorbs a number of harmful ingredients and oxidizes rapidly when subjected to welding heat, TIG welding in an inert gas atmosphere is distinctly advantageous. The welding of magnesium is similar, in many respects to the welding of aluminum. Magnesium was one of the first metals to be welded commercially by TIG. Magnesium requires a positive pressure of argon as a backup on the root side of the weld.

TITANIUM (DCSP)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	(NONE)	4, 5, 6	Argon	15 (7)	20	90 – 110	10 (256 mm)
	FILLET							110 – 150	8 (204.8 mm)
1/8 (3.2 mm)	BUTT	3/32 (2.4 mm)	1/16 (1.6 mm)	5, 6, 7	Argon	15 (7)	20	190 – 220	9 (230.4 mm)
	FILLET							210 – 250	7 (179.2 mm)
3/16 (4.8 mm)	BUTT	3/32 (2.4 mm)	1/8 (3.2 mm)	6, 7, 8	Argon	20 (10)	20	220 – 250	8 (204.8 mm)
	FILLET							240 – 280	7 (179.2 mm)
1/4 (6.4 mm)	BUTT (2)	1/8 (3.2 mm)	1/8 (3.2 mm)	8, 10	Argon	30 (15)	20	275 – 310	8 (204.8 mm)
	FILLET (2)							290 – 340	7 (179.2 mm)

WELDING TITANIUM

Small amounts of impurities, particularly oxygen and nitrogen, cause embrittlement of molten or hot titanium. The molten weld metal in the heat-affected zones must be shielded by a protective blanket of inert gases. Titanium requires a strong, positive pressure of argon or helium as a backup on the root side of the weld, as well as a long, trailing, protective tail of argon gas to protect the metal while cooling. Purge chambers and trailing shields are available from CK Worldwide to assist in providing quality results.

STAINLESS STEEL (DCSP)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	1/16 (1.6 mm)	4, 5, 6	Argon	11 (5.5)	20	80 – 100	12 (307.2 mm)
	FILLET							90 – 100	10 (256 mm)
1/8 (3.2 mm)	BUTT	1/16 (1.6 mm)	3/32 (2.4 mm)	4, 5, 6	Argon	11 (5.5)	20	120 – 140	12 (307.2 mm)
	FILLET							130 – 150	10 (256 mm)
3/16 (4.8 mm)	BUTT	3/32 (2.4 mm)	1/8 (3.2 mm)	5, 6, 7	Argon	13 (6)	20	200 – 250	12 (307.2 mm)
	FILLET	3/32 – 1/8 (2.4 mm – 3.2 mm)						225 – 275	10 (256 mm)
1/4 (6.4 mm)	BUTT	1/8 (3.2 mm)	3/16 (4.8 mm)	8, 10	Argon	13 (6)	20	275 – 350	10 (256 mm)
	FILLET							300 – 375	8 (204.8 mm)

WELDING STAINLESS STEEL

In TIG welding of stainless steel, welding rods having the AWS-ASTM prefixes of E or ER can be used as filler rods. However, only bare uncoated rods should be used. Stainless steel can be welded using ACHF, however, recommendations for DCSP must be increased 25%. Light gauge metals less than 1/16" thick should always be welded with DCSP using argon gas. Follow the normal precautions for welding stainless such as: clean surfaces, dry electrodes, use only stainless steel tools and brushes, carefully remove soap from welds after pressure testing and keep stainless from coming into contact with other metals.

LOW ALLOY STEEL (DCSP)

Metal Gauge	Joint Type	Tungsten Size	Filler Rod Size	Cup Size	Shield Gas Flow			Welding Amperes	Travel Speed
					Type	CFH (L/MN)	PSI		
1/16 (1.6 mm)	BUTT	1/16 (1.6 mm)	1/16 (1.6 mm)	4, 5, 6	Argon	15 (7)	20	95 – 135	15 (384 mm)
	FILLET							95 – 135	15 (384 mm)
1/8 (3.2 mm)	BUTT	1/16 – 3/32 (1.6 mm – 2.4 mm)	3/32 (2.4 mm)	4, 5, 6	Argon	15 (7)	20	145 – 205	11 (281.6 mm)
	FILLET							145 – 205	11 (281.6 mm)
3/16 (4.8 mm)	BUTT	3/32 (2.4 mm)	1/8 (3.2 mm)	7, 8	Argon	16 (6.5)	20	210 – 260	10 (256 mm)
	FILLET							210 – 260	10 (256 mm)
1/4 (6.4 mm)	BUTT	1/8 (3.2 mm)	5/32 (4.0 mm)	8, 10	Argon	18 (8.5)	20	240 – 300	10 (256 mm)
	FILLET (2)							240 – 300	10 (256 mm)

WELDING LOW ALLOY STEEL

Mild and low carbon steels with less than 0.30% carbon and less than 1" thick generally do not require preheat. An exception to this allowance is welding on highly restrained joints. These joints should be preheated 50°F to 100°F to minimize shrinkage cracks in the base metal. Low alloy steels such as the chromium-molybdenum steels will have hard heat affected zones after welding, if the preheat temperature is too low. This is caused by rapid cooling of the base material and the formation of martensitic grain structures. A 200°F to 400°F preheat temperature will slow the cooling rate and prevent the martensitic structure.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Excessive Electrode Consumption	Inadequate gas flow	<i>Increase gas flow</i>
	Improper size electrode for current required	<i>Use larger electrode</i>
	Operating of reverse polarity	<i>Use larger electrode or change polarity</i>
	Electrode contamination	<i>Remove contaminated portion, then prepare again</i>
	Excessive heating inside torch	<i>Replace collect, try wedge collet or reverse collet</i>
	Electrode oxidizing during cooling	<i>Increase gas post flow time to 1 sec. per 10 amps</i>
	Shield gas incorrect	<i>Change to proper gas (no oxygen or Co2)</i>
Erratic Arc	Incorrect voltage (arc too long)	<i>Maintain short arc length</i>
	Current too low for electrode size	<i>Use smaller electrode or increase current</i>
	Electrode contaminated	<i>Remove contaminated portion, then prepare again</i>
	Joint too narrow	<i>Open joint groove</i>
	Contaminated shield gas, dark stains on the electrode or weld bead indicate contamination	<i>Most common cause is moisture or aspirated air in gas stream. Use welding grade gas only. Find the source of contamination and eliminate it promptly.</i>
	Base metal is oxidized, dirty or oily	<i>Use appropriate chemical cleaners, wire brush or abrasives prior to welding.</i>
Inclusion of Tungsten or Oxides in Weld	Poor scratch starting technique	<i>Many codes do not allow scratch starts. Use copper strike plate. Use high frequency arc starter.</i>
	Excessive current for tungsten size used.	<i>Reduce current or use larger electrode</i>
	Accidental contact of electrode with puddle	<i>Maintain proper arc length</i>
	Accidental contact of electrode to filler rod	<i>Maintain a distance between electrode and filler metal</i>
	Using excessive electrode extension	<i>Reduce electrode extension to recommended limits</i>
	Inadequate shielding or excessive drafts	<i>Increase gas flow, shield arc from wind, or use gas lens</i>
	Wrong gas	<i>Do not use Ar-O2 or Ar-Co2 GMA (MIG) gases for TIG welding</i>
	Heavy surface oxides not being removed	<i>Use ACHF, adjust balance control for maximum cleaning, or wire brush and clean the weld joint prior to welding.</i>
Porosity in Weld Deposit	Entrapped impurities, hydrogen, air, nitrogen, water vapor	<i>Do not weld on wet material. Remove condensation from line with adequate gas pre-flow time.</i>
	Defective gas hose or loose connection	<i>Check hoses and connections for leaks</i>
	Filler material is damp (particularly aluminum)	<i>Dry filler metal in oven prior to welding</i>
	Filler material is oily or dusty	<i>Replace filler metal</i>
	Alloy impurities in the base metal such as sulphur, phosphorus, lead and zinc	<i>Change to a different alloy composition which is weldable. These impurities can cause a tendency to crack when hot.</i>
	Excessive travel speed with rapid freezing of weld trapping gases before they escape	<i>Lower the travel speed</i>
Cracking in Welds	Contaminated gas shield	<i>Replace the shielding gas</i>
	Hot cracking in heavy section or with metals which are hot shorts	<i>Preheat, increase weld bead cross-section size, change weld bead contour. Use metal with fewer alloy impurities.</i>
	Crater cracks due to improperly breaking the arc or terminating the weld at the joint edge	<i>Reverse direction and weld back into previous weld at edge. Use Aprack or foot control to manually down slope current.</i>
	Post weld cold cracking, due to excessive joint restraint, rapid cooling, or hydrogen embrittlement	<i>Preheat prior to welding, use pure to non-contaminated gas. Increase the bead size. Prevent craters or notches. Change the weld joint design.</i>
	Centerline cracks in single pass welds	<i>Increase bead size. Decrease root opening, use preheat, prevent craters.</i>
Inadequate Shielding	Underbead cracking from brittle microstructure	<i>Eliminate sources of hydrogen, joint restraint, and use preheat.</i>
	Gas flow blockage or leak in hoses or torch	<i>Locate and eliminate blockage or leak.</i>
	Excessive travel speed exposes molten weld to atmospheric contamination	<i>Use slower travel speed or carefully increase the flow rate to a safe level below creating excessive turbulence. Use trailing shield cup.</i>
	Wind or drafts	<i>Set up screens around the weld area</i>
	Excessive electrode stickout	<i>Reduce electrode stickout. Use a larger size cup.</i>
Arc Blow	Excessive turbulence in gas stream	<i>Change to gas saver parts or gas lens parts.</i>
	Induced magnetic field from DC weld current	<i>Change to ACHF current. Rearrange the split ground connection.</i>
Short Parts Life	Arc is unstable due to magnetic influences	<i>Reduce weld current and use arc length as short as possible.</i>
	Short water cooled leads life	<i>Verify coolant flow direction, return flow must be on the power cable lead.</i>
	Cup shattering or breaking in use	<i>Change cup size or type, change tungsten position, refer to CK Worldwide technical specifications available at www.ckworldwide.com</i>
	Short collet life	<i>Ordinary style is split and twists or jams, change to wedge style.</i>
	Short torch head life	<i>Do not operate beyond rated capacity, use water cooled model, do not bend rigid torches</i>
	Gas hoses ballooning, bursting or blowing off while hot	<i>Incorrect flowmeter, TIG flowmeters operate at 35 psi with low flows. MIG flowmeters operate with high flows at 65 psi or more.</i>

